

*8/19/2016*

**Sixth Annual Report of the Nutrient Scientific Advisory Board  
To the Secretary  
Of the N.C. Department of Environmental Quality  
As Required by Session Law 2009-216**

**August 19, 2016**

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## Executive Summary

In its sixth year serving as a guide to the Division of Water Resources (DWR) Nonpoint Source Planning staff in implementing existing development stormwater nutrient rule requirements pursuant to [Session Law 2009-216](#), the Nutrient Scientific Advisory Board (the board) continued to meet and actively assist the Division in several efforts during 2015-2016. This annual report is required by the session law and was assembled by Division staff with guidance and review by the board.

The board was active this year at a reduced pace in response to DWR Nonpoint Source Planning staff needs. The board met four times over the past year in support of the following rule-related actions:

1. Collaborated with the staff and the Upper Neuse River Basin Association (UNRBA) on the development of nutrient crediting and design standards for additional load-reducing measures for use in both the Jordan and Falls watersheds. This included reviewing draft practice documents and providing input on the nutrient credit standards and design specifications for six practices.
2. Reviewed the approval process guidance for these additional load-reducing measures and provided input to the staff on ways to clarify and streamline the process.
3. Provided feedback and participated in beta-testing recent updates to the Jordan Falls Stormwater Accounting Tool.
4. Provided feedback on rule revisions options for the Jordan and Falls Lake New Development and Existing Development stormwater rules.

Sections I - IV of this document provide summaries of each of these activities. More information on the board's activities, including previous annual reports, meeting agendas and minutes can be found at the Division's NSAB website at: <http://portal.ncdenr.org/web/jordanlake/nutrient-scientific-advisory-board>

## Background

Session Law 2009-216 established requirements for local governments and state and federal entities in the Jordan Lake watershed to reduce nutrient loading from existing developed lands. Given the precedent-setting nature of the requirements in this evolving area of nonpoint source water quality management, the drafters of the legislation felt it was important to establish an advisory body to assist the state in identifying all potential implementation options, their feasibility and value, and to identify any other analytical improvement needs for nutrient strategies in Jordan and other watersheds that may face similar requirements in the future. Therefore, the legislation also called for the formation a scientific advisory board for nutrient-impaired waters.

In July 2010, the DENR Secretary established a 10-member Nutrient Scientific Advisory Board, hereafter referred to as “the board” (see Appendix A for board membership). As specified in the legislation, six of the board’s members are representatives of local governments in the Jordan Lake watershed, while other members represent the N.C. Department of Transportation (NCDOT), the conservation community, and water quality science and stormwater engineering expertise. In 2013 the board also decided to add an unofficial, non-voting member to represent local governments in the Falls Lake watershed.

The board is charged with the following duties as described in Section (4)(b) of the session law:

- (1) Identify management strategies that can be used by local governments to reduce nutrient loading from existing development.*
- (2) Evaluate the feasibility, costs, and benefits of implementing the identified management strategies.*
- (3) Develop an accounting system for assignment of nutrient reduction credits for the identified management strategies.*
- (4) Identify the need for any improvements or refinements to modeling and other analytical tools used to evaluate water quality in nutrient-impaired waters and nutrient management strategies.*

The session law also provides the board the option of recommending a method for estimating existing development load reduction needs for affected parties in the Jordan watershed (Section (3)(d)(2)b.), and in Section (4)(c) charges the board more generally with advising the Secretary “on any other issue related to management and restoration of nutrient-impaired water bodies”.

The board completed its initial two-year charge with its July 2012 report to the Secretary. In July 2013, Division of Water Resources Planning staff presented a draft model local program for Existing Development rules implementation to the Environmental Management Commission and was granted additional time to work with affected parties to develop credit accounting for additional nutrient-reducing practices and other aspects of local guidance. Since then, the board has continued to actively assist the Division in better defining the extent of reduction needs on, and improving the set of tools with which to control nutrient loading from, existing developed lands. The remainder of this report provides updates on the board’s activities over the last year.

## I. Nutrient Measures for Existing Development Stormwater

**Background:** Section 4.(b) of Session Law 2009-216 charged the board with identifying, evaluating and developing accounting methods for additional measures that could be used by affected parties to reduce nutrient loading from existing development. In July 2013, Division staff presented a draft Model Local Program to the Environmental Management Commission that identified currently available nutrient-reducing practices in addition to an extensive list of other potentially creditable measures that was developed with input from the board.

In 2013, with guidance and review by the board, the Division utilized 205(j) grant funds to obtain a synthesis of the science characterizing the nutrient load reduction performance of six measures. The Division has since used that product as a basis for its efforts to develop practice crediting and design specifications for these measures.

Separately in 2013, the Upper Neuse River Basin Association (UNRBA) used member government funding and funding assistance from the department to contract for the development of nutrient crediting for an additional set of measures. During 2014, the contractor worked with the board, subject matter experts, the Division and other stakeholders to identify ten priority measures for full credit development and five additional measures for future credit development pending funding. In 2015, the contractor began developing credit methods and design specifications for the priority practices. They expect to complete these practices by December 2016.

**Status:** During the four meetings held in this reporting cycle, the board provided input on a total of six practices: stream restoration; StormFilter®; bioretention design variants; level spreader-filter strip design variants; soil amendment; and infiltration devices. Feedback from the board was used to make revisions to the content of draft practice guidance documents. The Division plans to continue working on the six practices noted and collaborating with the UNRBA to complete all ten of its practice documents by 2017.

Recently passed legislation (S.L. 2016-94) includes the requirement that stormwater treatment practices approved by the Chesapeake Bay Commission shall be allowed for use in the Jordan and Falls watersheds at the same pollutant removal efficiency value established for the Chesapeake Bay watershed, and calls on the Department to report on the need and desirability of establishing state-specific values for practices. The Division of Energy, Mineral and Land Resources will lead that process. It should be noted that while DWR staff have consistently utilized the work done by expert panels for the Chesapeake Bay Program as a starting point in its development of practice documents, it has been considered necessary to adjust or refine Chesapeake practices for specific conditions in North Carolina.

Once taken through a public comment process and finalized, practice crediting documents will be submitted to the appropriate Division Directors for approval. Approved practices add to the set of options that local governments and others may use to achieve load reductions from developed lands. Below is a summary table of existing and proposed nutrient practices and their current development status.

**Proposed Practices & Status**

Source Type	Practice	Relative Cost per Unit Reduction <sup>1</sup>	Development Status (% Complete)
Agricultural/ Rural	Riparian buffer restoration	\$	25
	Livestock exclusion <sup>2</sup>	\$	85
	Cropland conversion to trees or grass	\$\$	0
Ecosystem Restoration	Stream restoration/enhancement	\$\$\$\$	75
	Riparian buffer restoration – urban <sup>2</sup>	\$\$	35
	Land or forest protection <sup>2</sup>	\$\$\$	75
	Regenerative stormwater conveyance <sup>3</sup>	\$\$	10
Local Government	Improved street sweeping / Leaf Litter <sup>3</sup>	\$\$	80
	Increased urban canopy cover	\$\$	0
	Illicit Discharge Detection & Elimination <sup>2</sup>	\$	5
Urban Stormwater Retrofits <sup>4</sup>	Level spreader & vegetated filter strip retrofit <sup>2</sup>	\$\$	100
	Rainwater harvesting (rooftop retrofit)	\$	100
	Bioretention retrofit	\$\$\$	100
	Grassed swale retrofit	\$\$\$	100
	Permeable pavement retrofit	\$\$	100
	Stormwater wetland retrofit	\$\$	100
	Wet detention basin retrofit	\$\$	100
	Dry extended detention basin retrofit	\$\$\$\$	100
	Sand filter retrofit	\$\$\$\$	100
	Green roof	\$\$\$\$\$	100
	Disconnect impervious surfaces <sup>3</sup>	\$	95
	Floating treatment wetlands <sup>3</sup>	\$\$	90
	Infiltration devices <sup>2</sup>	\$\$	85
	StormFilter <sup>4</sup>	\$\$\$	85
	Filter strip design variants	\$	90
	Bioretention design variants <sup>2</sup>	\$\$	90
Soil improvement/urban nutrient management <sup>2</sup>	\$\$\$	85	
Algal turf scrubber <sup>5</sup>	\$	25	
Permeable pavement design variants <sup>3</sup>	\$\$	40	
Grass swale design variants	\$\$	40	
Wastewater	Remedy discharging sand filter <sup>3</sup>	\$\$	95
	Remedy malfunctioning septic system <sup>3</sup>	\$\$\$	65
	Regionalization (package plant)	\$\$\$	30

Footnotes

<sup>1</sup> Relative Cost Per Pound of N/P removed, \$, \$\$ - Low; \$\$\$ - Moderate; \$\$\$\$ , \$\$\$\$\$ - High.

<sup>2</sup> UNRBA developing practice credit document through its contractors Cardno & Center for Watershed Protection

<sup>3</sup> DWR using results of Tetra Tech 205J project to develop practice credit document

<sup>4</sup> Contech developing practice credit document.

<sup>5</sup> City of Durham Pilot Study ongoing

## II. Measures Approval Process

**Background:** In 2014-2015, the Division developed a *Nutrient Measures Approval Framework* guidance document with the board's assistance. This guidance outlines the process to follow in order to establish load reduction credit for nutrient-reducing measures that lack credit assignments.

**Status:** The Division has worked closely with the board to refine the measures approval process over the past two years. At the board's request, the Division provided clarification at the May 2016 meeting on the roles, responsibilities, and coordination between the board, DWR, and the DEMLR Stormwater Permitting Unit. The board provided helpful feedback on the process. Given the potential for overlapping efforts to establish crediting for stormwater practices with DEMLR, the Division plans to continue working closely with DEMLR as practices make their way through the approval processes.

Staff plan to have the measure approval process approved by the Director along with the first set of completed practices by the end of 2016.

## III. Beta Testing of Jordan Falls New Development Stormwater Tool

**Background:** The Jordan Falls stormwater tool was developed in 2010 for use by developers to show compliance with new development nutrient export targets in the Jordan and Falls watersheds. In May and June 2015, the board participated in beta-testing of an updated version of the tool (version 3.0) which led to further revisions by staff.

**Status:** During 2016, staff made significant improvements to the tool. These updates: greatly improved its functionality by adding BMP design variant options and adding the ability to both under- and oversize BMPs; improved data validation and feedback to the user; simplified updating or adding BMPs to the tool; and reconfigured the input and output worksheets to make the tool and its interface more user friendly. An updated version (version 4.0) was provided to the board for beta testing in May 2016. The board is currently testing it and providing feedback to the Division. Final revisions are expected to be completed by fall 2016 at which time it will be released for use by the regulated community.

## IV. Nutrient Rules Readoption Process

**Background:** Session Law 2013-413 (H74) requires review and readoption of all of the Division's water quality rules at least once every 10 years. Nonpoint Source Planning staff obtained feedback from the board on draft rule revisions covering all nutrient management strategies at the board's May 2015 meeting.

**Status:** In September 2015 the board provided staff additional input on new rule options addressing land disturbance thresholds and local program and reporting requirements in proposed revisions to the Falls and Jordan New Development and Existing Development Stormwater rules. Current versions are pending review and approval by the Department. However, given the enactment of S.L. 2016-94 during the 2016

legislative session, it appears that the Jordan and Falls rules will be reconsidered in full. Under this new legislation, the Environmental Management Commission is charged with beginning the rules readoption process by March 15, 2019. The Division will continue to collaborate with the board and other stakeholders in the watersheds throughout the rules readoption process.

## **V. Going Forward**

The Division will continue to work with the NSAB on a number of important tasks in the coming year. Staff will continue to seek the board's input on additional nutrient reducing practices as they make their way through the review and approval process. Staff will also seek the board's feedback on a number of items included in the recent nutrient management legislation as they relate to the Jordan and Falls rules readoption process. Additionally, the board will also continue to provide input into the ongoing effort to establish existing development load assignments for Falls and Jordan local governments.



## Appendix A

### Nutrient Scientific Advisory Board (NSAB) Membership

Session Law 2009-216 (4)(a) calls for establishment of the Board and stipulates a membership of five to ten members with the expertise or experience quoted below. Names and affiliations of the members currently occupying the applicable seats are provided in the footnotes.

**Table 1 - Nutrient Scientific Board Members**

	<b>NSAB Position</b>	<b>Member</b>	<b>Organization</b>
1	Local Government Representative <sup>1</sup>	Sandra Wilbur	City of Durham
2	Local Government Representative <sup>1</sup>	Allison Weakley	Town of Chapel Hill
3	Local Government Representative <sup>1</sup>	Michael Layne	City of Burlington
4	Local Government Representative <sup>1</sup>	David Phlegar	City of Greensboro
5	Local Government Representative <sup>1</sup>	Josh Johnson	Cities of Mebane and Graham; Towns of Elon and Gibsonville
6	Local Government Representative <sup>1</sup>	Matt Flynn	Town of Cary
7	Professional or Academic Representative <sup>2</sup>	Larry Band	UNC
8	Professional Engineer <sup>3</sup>	Bill Hunt	NCSU BAE
9	NC DOT Representative <sup>4</sup>	Andy McDaniel	NC DOT
10	Conservation Organization Representative <sup>5</sup>	Grady McCallie	NC Conservation Network
11	Falls Lake Watershed Representative <sup>6</sup>	Forrest Westall	Upper Neuse River Basin Association

<sup>1</sup> Representatives of one or more local government in the Jordan Reservoir watershed. Local government representatives shall have experience in stormwater management, flood control, or management of a water or wastewater utility.

<sup>2</sup> One member with at least 10 years of professional or academic experience relevant to the management of nutrients in impaired water bodies and possessing a graduate degree in a related scientific discipline, such as aquatic science, biology, chemistry, geology, hydrology, environmental science, engineering, economics, or limnology.

<sup>3</sup> One professional engineer with expertise in stormwater management, hydrology, or flood control.

<sup>4</sup> One representative of the Department of Transportation with expertise in stormwater management.

<sup>5</sup> One representative of a conservation organization with expertise in stormwater management, urban landscape design, nutrient reduction, or water quality.

<sup>6</sup> This member was added to the Board in January 2013 at the request of the Board members. It is not a legislatively required position, and therefore in an unofficial member with no voting rights.

(1-5 from Section 4.(a) of Session Law 2009-216)

**Appendix B**

**Excerpts from Session Law 2009-216 Related to the Establishment of the NSAB**

**Section 4.(a) – (c)**  
**SESSION LAW 2009-216**  
**HOUSE BILL 239**

AN ACT TO PROVIDE FOR IMPROVEMENTS IN THE MANAGEMENT OF THE JORDAN WATERSHED IN ORDER TO RESTORE WATER QUALITY IN THE JORDAN RESERVOIR.

The General Assembly of North Carolina enacts:

...

**SECTION 4.(a)** Scientific Advisory Board for Nutrient-Impaired Waters Established. – No later than July 1, 2010, the Secretary shall establish a Nutrient Sensitive Waters Scientific Advisory Board. The Scientific Advisory Board shall consist of no fewer than five and no more than 10 members with the following expertise or experience:

- (1) Representatives of one or more local governments in the Jordan Reservoir watershed. Local government representatives shall have experience in stormwater management, flood control, or management of a water or wastewater utility.
- (2) One member with at least 10 years of professional or academic experience relevant to the management of nutrients in impaired water bodies and possessing a graduate degree in a related scientific discipline, such as aquatic science, biology, chemistry, geology, hydrology, environmental science, engineering, economics, or limnology.
- (3) One professional engineer with expertise in stormwater management, hydrology, or flood control.
- (4) One representative of the Department of Transportation with expertise in stormwater management.
- (5) One representative of a conservation organization with expertise in stormwater management, urban landscape design, nutrient reduction, or water quality.

**SECTION 4.(b)** Duties. – No later than July 1, 2012, the Scientific Advisory Board shall do all of the following:

- (1) Identify management strategies that can be used by local governments to reduce nutrient loading from existing development.
- (2) Evaluate the feasibility, costs, and benefits of implementing the identified management strategies.
- (3) Develop an accounting system for assignment of nutrient reduction credits for the identified management strategies.

- (4) Identify the need for any improvements or refinements to modeling and other analytical tools used to evaluate water quality in nutrient-impaired waters and nutrient management strategies.

**SECTION 4.(c) Report; Miscellaneous Provisions.** – The Scientific Advisory Board shall also advise the Secretary on any other issue related to management and restoration of nutrient-impaired water bodies. The Scientific Advisory Board shall submit an annual report to the Secretary no later than July 1 of each year concerning its activities, findings, and recommendations. Members of the Scientific Advisory Board shall be reimbursed for reasonable travel expenses to attend meetings convened by the Department for the purposes set out in this section.